

Geographical Information Systems

Code: 100735
ECTS Credits: 6

Degree	Type	Year	Semester
2500241 Archaeology	OT	3	0
2500241 Archaeology	OT	4	0

Contact

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Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

Cristina Domingo Marimon

Prerequisites

Archaeology

Students enrolled in this course should have passed previously the course *Introduction to cartography* from the Archaeology Degree.

Objectives and Contextualisation

Archaeology

Geographic information systems are a very useful tool for archaeology, either for management and visualization of data collected both in surveys and excavations and for the later tasks of analysis, interpretation and mapping of the results.

According to this goal, the course has three main objectives:

1. To provide the principles for understanding and using geographic information systems (GIS) and database management systems (DBMS).
2. To provide a systematic knowledge of methodologies and analytical capabilities of GIS applied to archaeology, using examples and case studies specifically archaeological.
3. To provide a broad knowledge of the different types of archaeological applications of GIS, covering survey, excavation, landscape archaeology, modelling and prediction of site locations.

Competences

Archaeology

- Carrying out and managing archaeology fieldwork: excavation and survey.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

Learning Outcomes

1. Apply spatial relations on different regional scales through the relations between nature and society and through a temporal dimension.
2. Applying implementing protocols of fieldwork and sample collection.
3. Collect data in the field by using some of the basic measurement tools (GPS, total station).
4. Combining technical resources from similar disciplines.
5. Develop and use cartographic representations of real phenomena.
6. Identify appropriate technical solutions for practical needs to be resolved.
7. Identify the theoretical concepts that provide a foundation for technical operations.
8. Interpret maps and extract knowledge about spatial relations and their effect on material and cultural processes in societies.
9. Obtain and organise adequate data for each practical need to be solved.
10. Produce and organise cartographic data to resolve cartographic needs in archaeology.
11. Produce conventional graphic documents: planimetric, topographic, cartographic, illustrative drawing.
12. Produce maps from digital cartographic data, by using technical knowledge compilation, symbolization and cartographic design.
13. Use software of geographical information system to produce and transform digital cartographic data and creating maps.
14. Using the specific interpretational and technical vocabulary of the discipline.

Content

Archaeology

Part I. Fundamentals of GIS and DBMS (40%)

1. Geographic information systems applied to archaeology.
2. Geographic information systems software (GIS).
3. Database management systems (DBMS).
4. Spatial data management.

Part II. Managing and Analyzing spatial data (60 %)

5. Digital elevation models. Surface interpolation.
6. Exploratory analysis. Visualization and querying.
7. Cartographic analysis. Geoprocessing and map algebra.

8. Spatial analysis.
9. Terrain analysis. Geomorphology, hydrology, visibility.
10. Cost surface analysis. Minimal cost distance paths.

Methodology

Archaeology

Theoretical and methodological subjects are introduced with concise lectures and are developed by the autonomous work done by the students, which includes studying specific course materials (class notes provided for all the subjects) available at UAB Virtual Campus and general readings (bibliography and web resources).

Technical abilities are acquired by a set of guided exercises done by the students in a computer lab during the teaching period or on their own.

For each subject students will do 1 or 2 exercises at an approximate rate of one exercise per week.

All the course resources (class notes, exercises, quizzes, documents and data) are available online at UAB Virtual Campus (a Moodle based e-learning platform).

The activities that cannot be done in person will be adapted to the possibilities offered by the UAB virtual tools. The exercises, projects and theoretical classes will be carried out through virtual tools, such as tutorials, videos, TEAMS sessions, etc. The teacher will ensure that the student can access or offer alternative means, when available.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Guided exercises, either guided by teachers or using detailed tutorials	30	1.2	11, 12, 9, 3, 10, 13
Lectures with TIC support	20	0.8	1, 5, 7, 8, 14
Type: Supervised			
Exercises carried out by the students outside the classroom, according to a work plan supervised and evaluated by the lecturer	21	0.84	1, 2, 4, 5, 11, 12, 7, 6, 8, 9, 3, 10, 14, 13
Type: Autonomous			
Exercises done by the students according to a work plan. Personal readings	75	3	1, 2, 4, 5, 11, 12, 7, 6, 8, 9, 3, 10, 14, 13

Assessment

Archaeology

Evaluation of this course is continuous and is based on the outcome of the practical exercises, either guided or autonomous. All the exercises should be submitted in the time scheduled. Assignments not submitted in time can be

submitted at the end of the semester (several days before the final exam).

All the exercises are mandatory and have to be done individually. The average of all assignment grades is the exercises grade. Exercises can not be retaken nor re-evaluated.

The exercises grade must be validated passing a final exam at the end of the semester (first week of June).

To pass the course students have to:

- **submit at least 80% of the exercises assigned** to have the right to attend to the final exam.
- **pass the final (or recovery) exam with a minimum grade of 5 over 10.**

Once the final (or recovery exam) is passed, the final grade of the course will be the highest grade, either the exercises grade or the exam grade.

RECOVERY: Students that do not pass the final exam will have the right to do a recovery exam two weeks later, in the date scheduled by the school. Requirements for attending to the recovery exam are the same for attending to the final exam (80% of the exercises submitted).

In the event that tests or exams cannot be taken onsite, they will be adapted to an online format made available through the UAB's virtual tools (original weighting will be maintained). Homework, activities and class participation will be carried out through forums, wikis and/or discussion on Teams, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

UAB regulations regarding plagiarism and other irregularities in the evaluation process:

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

This subject does not incorporate single assessment.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Partial practical exams	30%	2	0.08	5, 11, 12, 8, 9, 3, 10, 13
Partial theoretical exams	30%	2	0.08	1, 2, 4, 7, 6, 8, 14
Practical exercises	40%	0	0	5, 11, 12, 9, 3, 10, 13

Bibliography

Archaeology

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Conolly, James and Lake, Mark (2009) *Sistemas de información geográfica aplicados a la arqueología*. Barcelona: Ediciones Bellaterra. 456 pp. (ISBN 978-8472904408)

Chapman, Henry (2006) *Landscape Archaeology and GIS*. Stroud: Tempus Publishing Group. 240 pp. (ISBN: 978-0752436031)

Grau, Ignacio (ed.) (2006) *La aplicación de los SIG en la arqueología del paisaje*. San Vicente del Raspeig: Universidad de Alicante. 259 pp. (ISBN: 978-847908863X)

Mehrer, Mark W. and Wescott, Konnie L. (eds.) (2005) *GIS and Archaeological Site Location Modeling*. Boca Raton, Florida: CRC Press. 496 pp. (ISBN: 978-0415315487)

Nunes, Joan (2012) *Diccionari terminològic de sistemes d'informació geogràfica*. Barcelona: Enciclopèdia Catalana i Institut Cartogràfic i Geològic de Catalunya. 551 pp. (ISBN 978-84-393-8863-0)

Consultable en línia a http://www.termcat.cat/ca/Diccionaris_En_Linia/197

Pons, Xavier i Arcalís Anna (2012) *Diccionari terminològic de Teledetecció*. Barcelona: Enciclopèdia Catalana i Institut Cartogràfic i Geològic de Catalunya. 597 pp. (ISBN 978-84-393-9008-4)

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Rabella, Josep M.; Panareda, Josep M. i Ramazzini, Graziana (2011) *Diccionari terminològic de cartografia*. Barcelona: Enciclopèdia Catalana i Institut Cartogràfic i Geològic de Catalunya. 417 pp. (ISBN 978-84-393-8690-2)

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Verhagen, Philip (2007) *Case Studies in Archaeological Predictive Modeling*. Leiden: Leiden University Press. 256 pp. (ISBN: 978-9087280076)

Wescott, Konnie L. and Brandon, R. Joe (eds.) (2000) *Practical Applications of GIS for Archaeologists: A Predictive Modelling Toolkit*. Boca Raton, Florida: CRC Press. 176 pp. (ISBN: 978-0748408306)

Wheatley, David and Gillings, Mark (2002) *Spatial Technology and Archaeology: The Archaeological Applications of GIS*. Boca Raton, Florida: CRC Press. 269 pp. (ISBN: 978-0415246408)

Software

Archaeology

GIS Software > Campus License GIS ArcGIS.

>> License: <https://forms.office.com/r/1QijPDxH0a>

>> Support and Resources: <https://bit.ly/SIGCampusUAB>

Software DBMS and office:

>> Microsoft 365: <https://si-respostes.uab.cat/inici/correu/msop-microsoft-office>